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NOTES ON THE GENUS *HYBRIZON* IN NORTH AMERICA (HYMENOPTERA: PAXYLOMMATIDAE)

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Abstract.—The two North American species of the unusual genus *Hybrizon* Fallén are redescribed from a large collection of specimens made in Virginia. Brief comments are made on the taxonomic placement of the genus and on the observed sex ratio of the collected material.

Key Words: taxonomy, Ichneumonoidea, ant-parasites

The genus *Hybrizon* Fallén is one of the most peculiar and taxonomically confusing groups in the Ichneumonoidae. It contains seven species (five Palearctic, two Nearctic) and is the only member in the family Paxylommatidae except for one undescribed genus from Japan. Because it lacks a second recurrent vein in the fore wing, the genus has often been classified as a subfamily of the Braconidae (Wesmael 1835, Curtis 1837, Haliday 1840, Muesebeck and Walkley 1951, Marsh 1963, Shenefelt 1969, van Achterberg 1976, Watanabe 1984). However, it also has been classified as a subfamily of the Ichneumonidae (Rasnitsyn 1980, Gauld 1984), or in a distinct family (Watanabe 1946, Tobias 1968, Marsh 1971, 1979, Mason 1981, van Achterberg 1984, Marsh et al. 1987). Mason (1981) argued convincingly that *Hybrizon* should be excluded from the Braconidae because it lacks a critical synapomorphy of the family, namely, the fusion of abdominal terga 2 and 3. Furthermore, van Achterberg (1984) gave two synapomorphies of wing venation that show the Paxylommatidae are more closely related to the Ichneumonidae than to the Braconidae. The same conclusion was reached by Sharkey and Wahl (1987), who suggested that *Hybrizon* might be placed within the Ichneumonidae. This action had already been proposed by Rasnitsyn (1980) who classified *Hybrizon* as a subfamily of the Ichneumonidae. However, Mason (1981) argued against this in favor of a separate family classification, the Paxylommatidae, and I have followed his classification in this paper.

During the summers of 1986 and 1987, my colleague, David R. Smith, operated several Malaise traps in two locations in Virginia, at his home in Annandale (a suburb of Washington, D.C.) and near Cuckoo in Louisa County. Approximately 200 specimens of *Hybrizon* were collected during these two years representing two species. Prior to this the U.S. National Museum contained only about 50 specimens of the genus. Approximately ⅔ of the specimens collected by Smith are *rileyi* (Ashmead); the other ⅓ are a distinct species which I thought was undescribed but now have identified as the previously unknown female of *flavocinctus* (Ashmead). I have provided descriptions and a key to separate the species below. Additional specimens were borrowed

from the Canadian National Collection, Ottawa, Canada (M. Sharkey), the American Entomological Institute, Gainesville, Florida (H. Townes), the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts (S. Shaw), and the Rijksmuseum van Natuurlijke Histoire, Leiden, The Netherlands (C. van Achterberg).

The biology of these unusual wasps has not been satisfactorily established. They are associated with ant nests and are likely to be endoparasitoids of ant larvae. Donisthorpe and Wilkinson (1930) give the most extensive review of the biology.

Of interest is the high ratio of females to males of the North American species in the National Collection, 241:14 in *rileyi* and 137:5 in *flavocinctus*. Female biased sex ratios are predicted by the local mate competition (LMC) model of Hamilton (1967), "... where females place offspring in discrete patches of the resource (in this case, ant colonies), and those offspring mate randomly in their patch before female offspring disperse to colonize new patches" (Waage 1985). On the other hand, the observed female biased sex ratio could merely be an artifact of collecting techniques, assuming that mating occurs in or near ant colonies and females searching for new colonies are the main dispersers. Thus, random sweeping or flight intercept traps would produce mostly females, whereas collections made in ant colonies might yield a more balanced sex ratio.

Family Paxylommatidae

Pachylommatoidae Foerster, 1862: 247. Oldest family-group name (see Mason 1981 for discussion).

Hybrizon Fallén

Hybrizon Fallén, 1813, p. 19. No species. Type-species: *Hybrizon latebricola* Nees, 1834. Monotypic, first included species by Nees (1834:28).

Paxylomma de Brébisson, 1825: 23. Type-species: *Paxylomma buccatum* de Brébbison. Monotypic. Synonymy by Wesmael, 1835.

Plancus Curtis, 1833: 188. Type-species: *Plancus apicalis* Curtis. Monotypic. Synonymy by Stephens, 1835.

Eurypterna Foerster, 1862: 247. Type-species: *Paxylomma cremieri* Romand. Monotypic. Synonymy by Marshall, 1891.

Eupachylomma Ashmead, 1894: 58. Type-species: *Wesmaelia rileyi* Ashmead. Original designation. Synonymy by Watanabe, 1935.

Ogkosoma Haupt, 1913: 52. Type-species: *Ogkosoma schwarzi* Haupt. Monotypic. Synonymy by Strand, 1914.

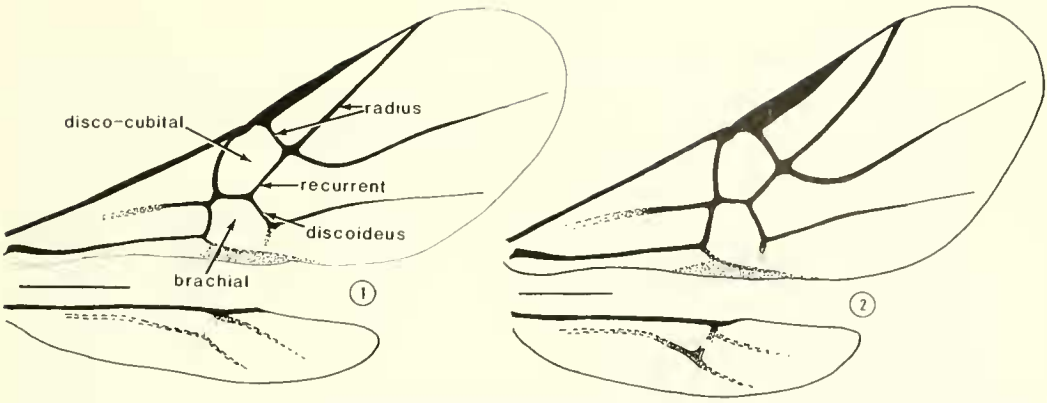
The names *Paxyloma* (Stephens 1835), *Paxylomme* (Wesmael 1835), *Paxyllomma* (Curtis 1837), *Paxylloma* (Blanchard 1840), and *Pachylomma* (Ratzeburg 1848) are all to be considered emendations of *Paxylomma* (see Shenefelt 1969 and Mason 1981).

Because of the small size of these wasps and the lack of a second recurrent vein in the fore wing, *Hybrizon* will key to Braconidae in most general textbooks with keys to Hymenoptera families. In view of this, *Hybrizon* was included by Marsh et al. (1987) in their identification manual for North American genera of Braconidae. The genus can be diagnosed by reference to couplet 1 of that key and the associated figures. Adult *Hybrizon* have a distinctive habitus (Fig. 3): narrow head with bulging eyes and deep anterior tentorial pits (Figs. 6, 7), strongly arched thorax, long spindly legs, and long thin abdomen.

The two North American species of *Hybrizon* can be separated by the following key.

Ocelli small, ocell-ocular distance at least equal to diameter of lateral ocellus, often greater (Fig. 9); first segment of radius in fore wing shorter than first segment of discoideus and about ½ length of recurrent vein, branchial cell not as tall as discocubital cell (Fig. 1); head, thorax and abdomen usually entirely black . . . . . *rileyi* (Ashmead)

Ocelli larger, ocell-ocular distance less than diameter of lateral ocellus, often less than half (Fig. 8);



Figs. 1, 2. Wings of *Hybrizon* species. 1, *H. rileyi* (Ashmead). 2, *H. flavocinctus* (Ashmead) (scale = 0.5 mm).

first segment of radius equal to or longer than discoideus and about ⅔ length of recurrent vein; brachial cell equal in height to disco-cubital cell (Fig. 2); head black, at least pronotum, mesopleuron and base of abdominal terga 3 and 4 honey yellow, sometimes thorax and abdomen extensively marked with honey yellow . . *flavocinctus* (Ashmead)

Hybrizon rileyi (Ashmead)

Figs. 1, 3, 4, 7, 9

Wesmaelia rileyi Ashmead, 1899: 641. Holotype female in U.S. National Museum, Washington, D.C.

Female. Length of body, 2–3 mm. Color: head black, clypeus and mouthparts white; antennal scape and pedicel yellow, flagellum black; thorax black or dark brown, rarely deep honey yellow; legs yellow with hind femur, tibia, and coxa often light brown; tegula yellow; abdomen black or dark brown, rarely basal segments dark honey yellow. Head: very weakly reticulate, smooth and shining; ocellar-ocular distance equal to or greater than diameter of lateral ocellus (Fig. 9); clypeus lengthened, apical margin well below level of lower eye margin, malar space slanted (Fig. 7); antenna with 11 flagellomeres. Thorax: pro and mesothorax smooth and shining; propodeum irregularly rugose, without any indication of median longitudinal carina. Abdomen: terga smooth and shining, terga 1 and 2 sometimes weakly striate at base (Fig. 4). Wings (Fig. 1): first segment of radius shorter than first segment of discoideus and about ½ length of recurrent vein, brachial cell not as tall as disco-cubital cell.

Male. Essentially similar to female.

Type locality. UNITED STATES: Oxford, Indiana.

Material examined. 241 ♀♀, 14 ♂♂ from the following states and provinces: District of Columbia, Georgia, Indiana, Iowa, Kansas, Maine, Maryland, Michigan, New Hampshire, New Jersey, New York, North Carolina, Nova Scotia, Ontario, Pennsylvania, Quebec, South Carolina, Virginia, West Virginia, Wisconsin.

Biology. The type material is recorded as being reared from *Toxopotera* (= *Schizaphis*) *graminum*, but this is probably not correct. Three specimens from New Hampshire are labelled "Attracted to disturbed nest of *Lasius alienus*."

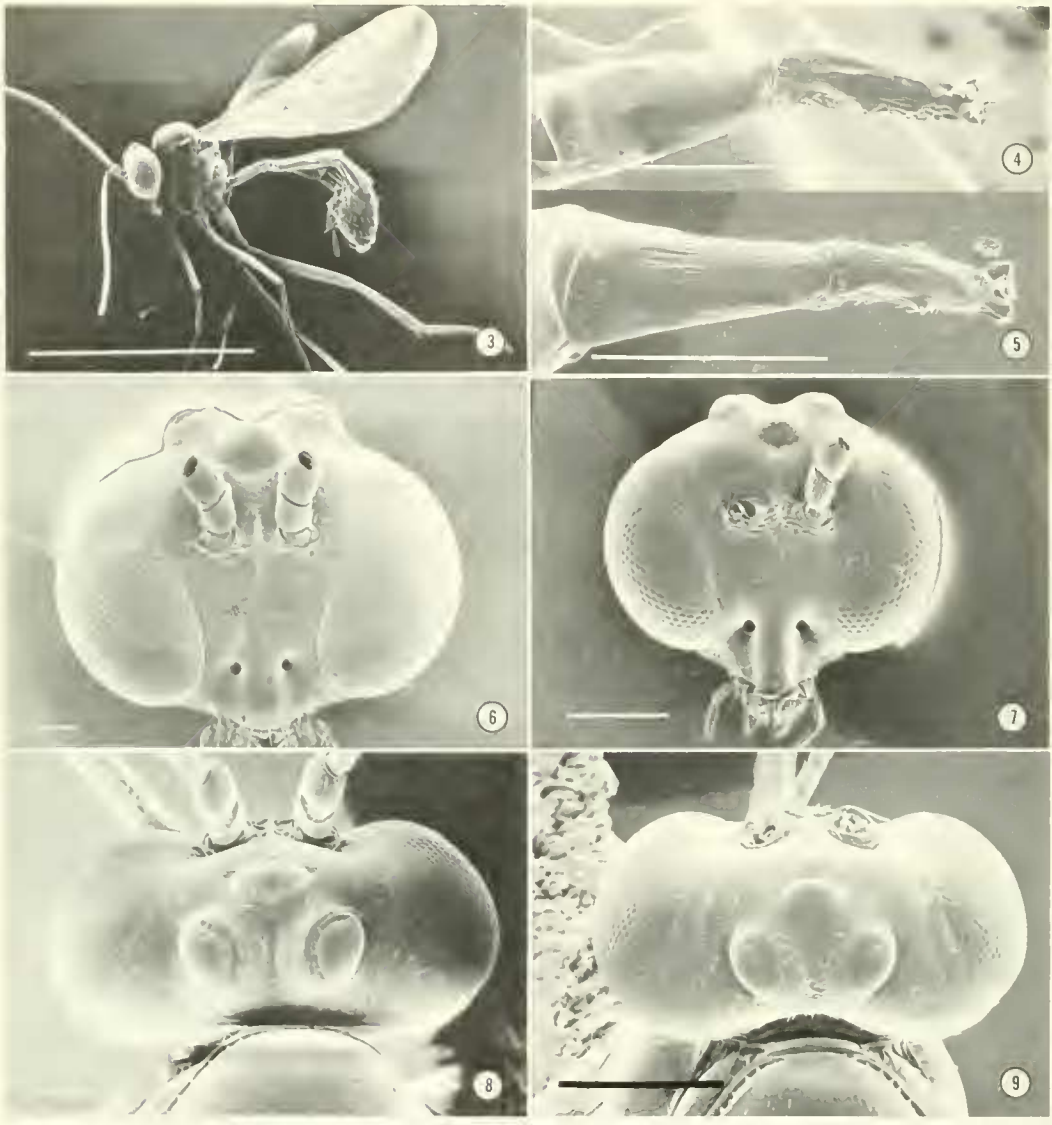
This species is easily distinguished from *flavocinctus* by its darker color, smaller ocelli, and wing venation.

Hybrizon flavocinctus (Ashmead)

Figs. 2, 5, 6, 8

Eupachylomma flavocincta Ashmead, 1894: 59. Holotype female in U.S. National Museum, Washington, D.C.

Female. Length of body, 3.5–4 mm. Color: head black, clypeus and mouth parts light yellow; antennal scape and pedicel yellow, flagellum black; prothorax honey yellow;



Figs. 3–9. *Hybrizon* species. 3, *H. rileyi* (Ashmead), habitus (scale = 2 mm). 4, *H. rileyi*, abdominal terga 1–2 (scale = 500 μ). 5, *H. flavocinctus* (Ashmead), abdominal terga 1–2 (scale = 500 μ). 6, *H. flavocinctus*, face (scale = 100 μ). 7, *H. rileyi*, face (scale = 200 μ). 8, *H. flavocinctus*, vertex (scale = 200 μ). 9, *H. rileyi*, vertex (scale = 200 μ).

mesonotum dark brown or black, sometimes with yellow longitudinal lines; scutellum yellow with brown spot at base; mesopleuron varying from entirely brown to yellow; propodeum dark brown; tegula yellow; legs yellow, hind femur, tibia, and coxa light brown; abdomen brown, terga 3 and 4 yellow at base. Head: reticulate and dull; ocell-ocular distance less than diameter of lateral ocellus, inner edge of each ocellus margined by a scrobiculate groove (Fig. 8); clypeus short, apical margin only slightly below level of lower eye margin, malar space nearly horizontal, eyes bulging below (Fig. 6); antenna with 11 flagellomeres. Thorax: pro- and mesothorax smooth

and shining; propodeum irregularly rugose, often with a short median carina. Abdomen: first and second terga usually distinctly striate (Fig. 5), rest of terga smooth and shining. Wings (Fig. 2): first segment of radius equal to or longer than discoideus and about ⅔ length of recurrent vein, brachial cell about as tall as discocubital cell.

Male. Essentially as in female, occasionally body mostly honey yellow.

Type locality. UNITED STATES: Washington, D.C.

Material examined. 137 ♀♀, 5 ♂♂ from the following states and provinces: District of Columbia, Maryland, Michigan, New York, Ontario, Virginia, Wisconsin.

Biology. Unknown.

Prior to this study, the only authentically determined specimen of *flavocinctus* was the male holotype. The large number of female specimens collected in Virginia were generally much darker in color than the holotype and I had thought them to be an undescribed species. After closer examination, they agree morphologically with the holotype and I now consider them to be the undescribed female of *flavocinctus*.

This species differs from *rileyi* in its larger size, larger ocelli, generally lighter body color, and wing venation. It is also very similar to the European *buccatus* (de Brébisson) which is distinguished by its darker body color, by having stronger sculpturing on the head which is almost punctate, and by having a few punctures on the mesonotum along where the notauli would be.

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